

MAPS Layers for sPHENIX

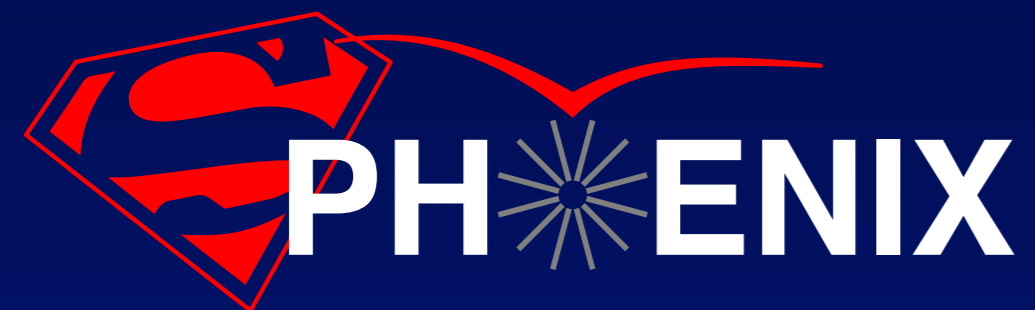
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sPHENIX Tracking Discussion

Los Alamos, NM

January 29th 2016



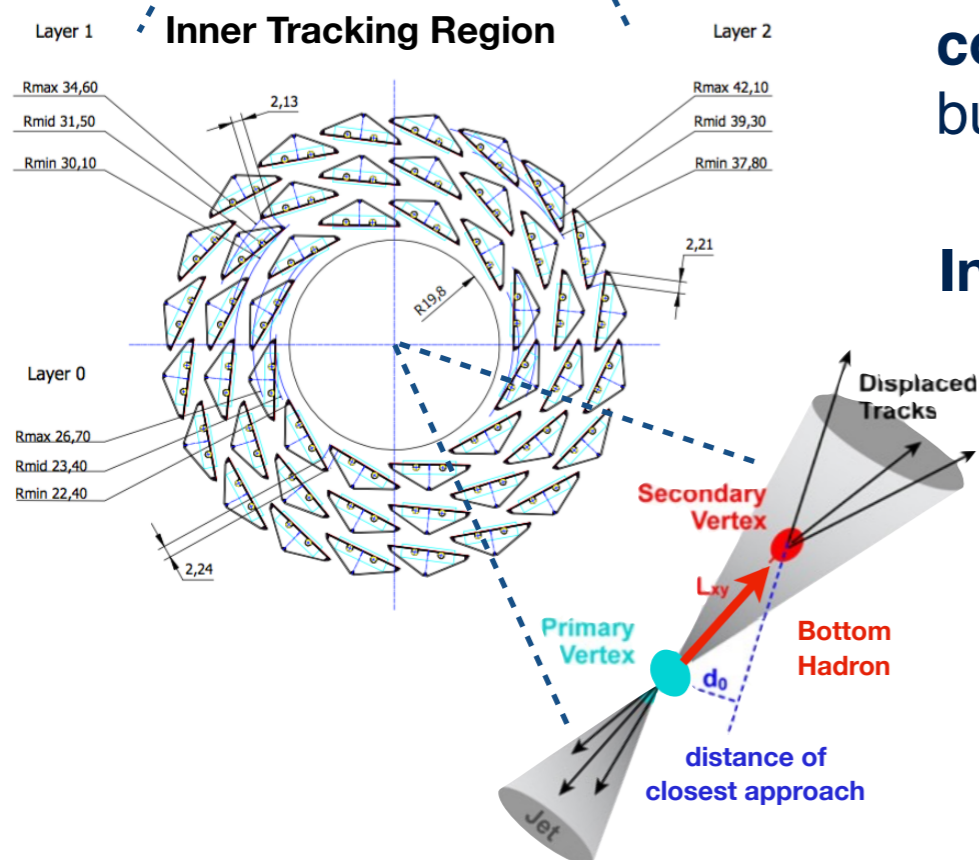
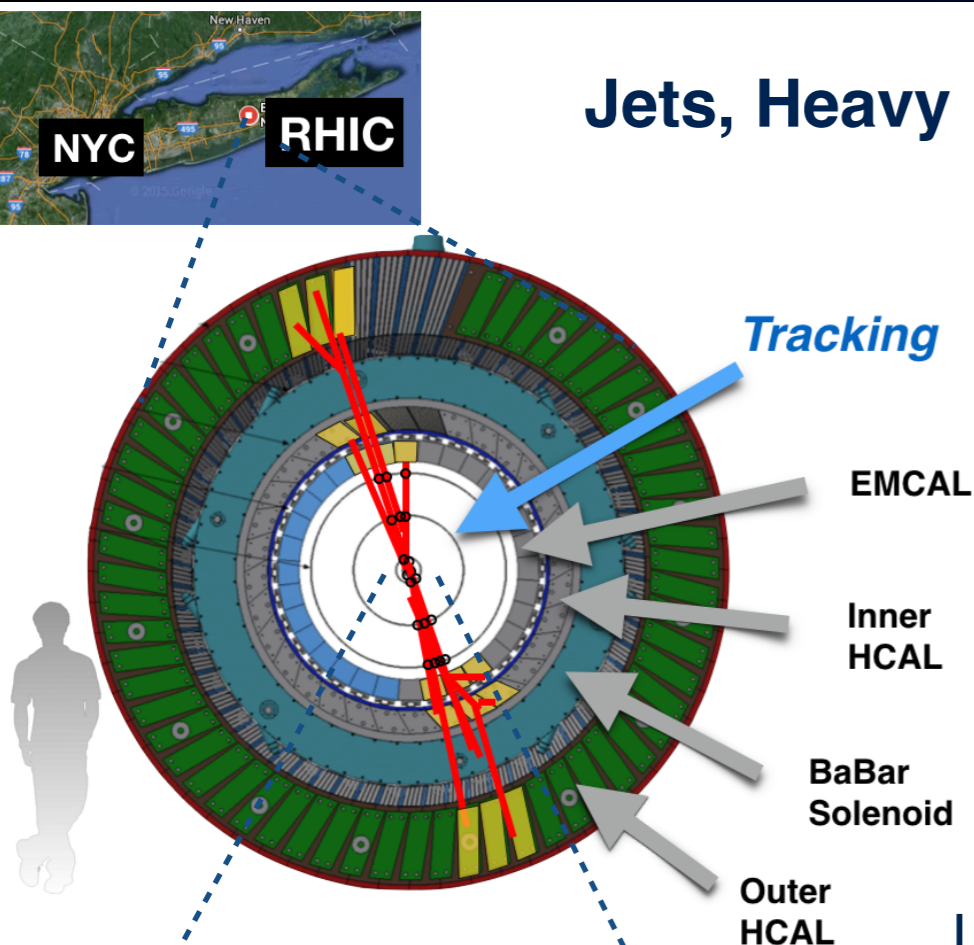
Role of MAPS in sPHENIX

Jets, Heavy Flavor Jets, and Upsilon's at RHIC in 2022 & 2023

Physics: study of QGP structure over a range of length scales and temperatures with **hard-scattered probes inc. bottom quark jets**

"[sPHENIX] presented a compelling physics program."
~ sPHENIX DOE Science Review Committee

sPHENIX highlighted in Hot QCD Long Range Plan



LANL's expertise with silicon tracking is **needed to design and construct an inner tracker** for many specialized measurements, but especially for **bottom quark jet observables**.

Inner Silicon Concept with Monolithic Active Pixel Sensors:

Very fine pitch ($<30 \times 30 \text{ um}$), large efficiency ($>99\%$)

Optimizations for material thickness, $\sim 0.3\%/\text{layer}$

With a new inner tracker from LANL, sPHENIX will be able to measure b-jets, providing critical confirmation for the discovery of the QGP microscopic structure

Laboratory Funding Path Update

Laboratory Directed Research & Development

National security depends on science and technology. The United States relies on Los Alamos National Laboratory for the best of both. No place on Earth pursues a broader array of world-class scientific endeavors.



Immediate efforts:

- * We received a FY16 call for surplus funds
- * We've proposed to utilize these funds for additional prototype boards

FY17 LDRD DR proposal status and timeline:

- * In Dec, we pushed for sPHENIX MAPS in the lab town-halls
We are the top ranked priority under Nuclear Physics
- * We've been meeting with our division to garner their support for our proposal
Theory Division last week, Physics Division again next week
- * We've been assigned a red team to review our pre-proposal document
- * We will be drafting support statements next week
- * Pre-proposal documents are submitted on Feb 10th at COB
- * These are internally reviewed and a request for full proposals will be a few weeks later
- * We expect success, as we passed this stage last year
- * Full proposals will be due approx. mid-April
- * Both internally and externally reviewed, results in a review document
- * Oral defense of the review and response to questions in document, ~May
- * Funding decisions are rendered by ~June
- * Few 100K of funding available immediately
- * Review within first 6 mo opens full funding stream \$1.65M / yr including FTEs

Exploring New Collaborations

Looking to **produce ties with LBL on MAPS development**

- * Need to define level of interest and mutually beneficial activities
- * Ming & Hubert visited the MAPS lab at LBL during the January workfest
- * Mike will fly to LBL in two weeks to do the same, but also get copies of the ladder sims and plan future efforts with LBL
- * Barbara will visit LANL the following week to give a colloquium and continue future effort with the full team
- * A few other institutions have expressed interested in collaborations with student time, we can expand these roles once we have LDRD funding with technology sharing (sims, FPGA programming, etc)



Santa Fe MAPS C&S Workshop

LANL is planning to **host a cost & schedule workshop in Santa Fe** towards the end of March

- * obtaining program development funds to cover ALICE ITS experts travel and meeting room
- * 3 day workfest to produce a complete C&S document for the inner tracker and a full tracker option
- * trying to settle on dates, incumbent on experts travel, others involved in sPHENIX welcome
- * only light introductory talks on day 1, most meeting time focused on document construction
- * LANL will need to prepare a draft document in advance of the meeting to have a framework in place as a starting point



Additional Details